

Hardarik Blühdorn
Mannheim

A semantic typology of sentence connectives¹

Abstract

Connectives are conjunctions, prepositions, adverbs and other particles which share the function of encoding semantic relations between sentences, or rather, between semantic objects some of which can be meanings of sentences. The relata linked by any such relation will fall into one of four distinct categories: they will be physical objects, states of affairs, propositions, or pragmatic options (the atoms of human interaction). Physical objects constitute the conceptual domain of space, states of affairs the domain of time, propositions the epistemic domain, and pragmatic options the deontic domain. The relations encodable in any of these domains can be divided into four basic types: similarity relations, situating relations, conditional relations, and causal relations. Conceptual domains and types of relations define the universe of possible connections between semantic objects.

Connectives differ as to the interpretations they permit in terms of conceptual domains and types of relations. Very few connectives are specialized on relata of one certain category and relations of one certain type. Possible examples in German are *später* ('later on') and *zwischenzeitlich* ('in the meantime'), which encode situating relations between states of affairs. Other connectives are specialized on relata of one certain category, but are underspecified with respect to the type of relation. An example is German *sobald* ('as soon as'), which can only connect states of affairs, but accepts situating, conditional and causal readings. Connectives of a third group are specialized on relations of a certain type, but are underspecified with respect to the category of the relata. Examples of this kind are German *weil* ('because') and *trotzdem* ('nevertheless'), which encode causal relations, but accept states of affairs, propositions and pragmatic options as their relata. Connectives of a fourth group are underspecified both for the category of relata and the type of relation. An example is German *da* ('there'), which accepts relata of any category and allows for situating, conditional and causal readings. Connectives like *und* ('and') and *oder* ('or') exhibit an even higher degree of underspecification, in that they allow for all kinds of relations and relata.

¹

I am grateful to Marina Foschi Albert, Ekkehard König, and to several participants of the conference *40 Years of Particle Research* (University of Bern, 11th–13th February, 2009) for their comments on earlier versions of this paper.

1. Introduction

This paper deals with connectives, a class of words which most linguists do not think of in the first place when they talk about particles. However, many elements generally considered as prototypical particles – such as modal particles, focus particles and discourse particles (cf. Zifonun et al.: 1997, 56ff) – can be shown to share the function of connecting semantic objects some of which can be meanings of sentences (see Dimroth: 2004, 23ff; Alm: 2007, 35ff; Diwald: 2007, 128ff). Those particles are functionally connectives. On the other hand, all elements typically classified as connectives fulfill the traditional definition of particles as uninflected function words (Bußmann: 2002, 498f). So it might, in fact, be the case that connectives and particles are very similar classes looked at from different points of view.

I will not enter into this interesting question here. My concern will be the semantic typology of connectives. I will not be looking at modal particles, focus particles or discourse particles, but restrict myself to coordinating conjunctions such as *und* ('and') or *oder* ('or'), subordinating conjunctions such as *nachdem* ('after'), *wenn* ('when', 'if') or *weil* ('because'), prepositions such as *auf* ('on') or *angesichts* ('in view of'), and linking adverbs such as *da* ('there') or *trotzdem* ('nevertheless') (for a general survey on the syntax of these classes of connectives in German see Pasch et al.: 2003; Blühdorn: 2008; Blühdorn: 2010). My examples in what follows will be from German with English glosses, but the typology is meant to be suitable for other languages as well.

2. Categories of *relata*

John Lyons (1977, 442ff) was the first to make the suggestive distinction between first order, second order and third order entities, which has since then been taken up by several authors (see, e.g., Kortmann: 1996, 28ff; Dik: 1997, 136f; Blühdorn: 2008; Blühdorn: 2010). A variant of this ontology can be used as the starting point for a theory of the semantics of connectives.

Let us assume that conceptual entities can be divided into four major categories (for a more detailed exposition see Blühdorn: 2008; Blühdorn: 2010):

- physical (spatial) objects,
- states of affairs (temporal entities: events and states),
- propositions (epistemic entities),
- pragmatic options (deontic entities).

Physical objects have spatial properties. They are spatially extended and are linked to each other by spatial relations: insideness, aboveness, behindness etc. They occur or fail to occur in the context of other physical objects. The conceptual domain in which they can occur and in which they are linked to each other is the domain of space (see Frawley: 1992, 250ff). Example (1) gives an illustration:

- (1) *die Katze **auf** dem Sofa*²
 'the cat **on** the sofa'

A natural interpretation of (1) is that a physical object described as a cat occurs in the spatial context of another physical object described as a sofa. The relation between the two objects is described by the preposition *auf* ('on'): a relation of contact in the vertical dimension. The connected morphosyntactic expressions are noun phrases.

States of affairs have temporal properties. They are temporally extended and are linked to each other by temporal relations: anteriority, posteriority, simultaneity etc. They are the case or fail to be the case in the context of other states of affairs. The conceptual domain in which states of affairs can be the case and in which they are linked to each other is the domain of time (see Frawley: 1992, 336ff; Blühdorn: 2004a; Blühdorn: 2004b; Schilder: 2004). Examples (2) and (3) are illustrations:

- (2) *Sie rauchten eine Pfeife **nach** dem Mittagessen.*
 'They smoked a pipe **after** lunch.'
- (3) *Er vergaß, den Brief abzuschicken, **nachdem** er ihn verschlossen hatte.*
 'He forgot to post the letter **after** he had sealed it.'

A natural interpretation of (2) is that an event of smoking a pipe happened in the context of an event of having lunch. The relation between the two states of affairs, described by the preposition *nach* ('after'), is to be understood as temporal sequence. A likely interpretation of (3) is that posting the letter failed to happen in the context of sealing it. Again the relation is temporal sequence, this time encoded by the subordinating conjunction *nachdem* ('after'). The connected morphosyntactic expressions are a clause and a noun phrase in (2) and two clauses in (3).

Propositions have epistemic (logical) properties. According to Lyons (1977, 445), a proposition is an entity capable of being assigned a truth-value. Propositions are epistemically extended (i.e., they have areas and degrees of logical validity), and they are linked to each other by epistemic (logical) relations: entailment, equivalence, complementarity etc. Propositions are judged as true or false in the context of other propositions (being consistent or inconsistent with prior knowledge; see Gethmann: 1978, 647). The conceptual domain in which propositions can be true and in which they are linked to each other is the epistemic domain (see Frawley: 1992, 406ff). Two examples:

- (4) *Die Tabelle zeigt die Verfügbarkeit von Bauland seit 1995. **Ansichts** dieser Zahlen ist es schwierig zu glauben, dass Mangel an Bauland der Grund dafür gewesen sein kann, dass weniger Häuser gebaut wurden.*
 'The table shows the land supply situation since 1995. **In view of** these figures, it is hard to believe that shortage of building land can have been the reason why fewer houses were built.'

² All German examples are in italics. English glosses are in regular characters, enclosed in single quotation marks. The glosses are meant as semantic paraphrases rather than grammatically and stylistically perfect translations. The connectives under discussion are boldfaced.

- (5) *Da eine gründliche Lektüre mehrere Stunden gedauert hätte, kann es nur eine sehr oberflächliche Revision gewesen sein.*
 'Since a thorough reading would have taken several hours, it can only have been a very cursory revision.'

The proposition discussed in (4) is that the reduction of house building was due to a shortage of building land. The speaker suggests that this proposition cannot be assigned a positive truth-value in the epistemic context defined by the knowledge of the figures in the table. The proposition discussed in (5) is that the revision talked about was very cursory. The speaker suggests that this proposition should be assigned a positive truth-value in the epistemic context defined by the knowledge that a thorough reading would have taken several hours. In both examples the connectives indicate epistemic relations between (sets of) propositions. In (4) the connective is the preposition *angesichts* ('in view of'); the connected morphosyntactic expressions are a clause and a noun phrase. In (5) the connective is the subordinating conjunction *da* ('since'); the connected expressions are both clauses.

Entities of the fourth category – fourth order entities, as Dik (1997, 136f) calls them – have not yet received a generally accepted name in standard linguistic terminology. Let us call them pragmatic options. This category comprises the atoms of human interaction, including speech acts and all other kinds of acts, and also intentions, goals, and projects, i.e., possible acts and events, which have not yet been put into practice, but which are objects of human desires. The defining feature of a pragmatic option in this sense is that it can be desired, or, in more technical terms, that it can be assigned a value of desirability. Objects of this category have deontic (ethical) properties. They are deontically extended (i.e., they have areas and degrees of pragmatic validity), and they are linked to each other by deontic relations: compatibility, conflict, means, purpose etc. Pragmatic options are desirable or undesirable in the context of other pragmatic options. The conceptual domain in which they can be assigned a value of desirability and in which they are linked to other pragmatic options is the deontic domain (see Lyons: 1977, 823ff; Frawley: 1992, 419ff). An example:

- (6) *Um ein Erasmus-Stipendium beantragen zu können, dürfen Sie nicht mehr im ersten Studienjahr sein.*
 'In order to be eligible for an Erasmus Student Grant, you must not be in your first year of study.'

The object discussed in (6) is the option for a student to be still in the first year of the university course. The deontic context in which the desirability of this option is evaluated is defined by the student's desire to receive an Erasmus Grant. The value of desirability assigned is negative. The deontic relation between the two options is indicated by the preposition *um* ('in order'). One of the connected morphosyntactic expressions is an infinitive phrase, the other one is a clause.

The four categories of entities are meant to give a full account of the constituents of the world, as far as they can be referred to by means of natural languages. Physical objects can only be referred to by noun phrases. States of affairs, propositions and pragmatic options can be encoded by noun phrases or by clauses. Table 1 gives a schematic overview of the four categories and the corresponding conceptual domains:

Order of entity (Lyons 1977)	Class of entity	Conceptual domain	Context- value	Encoding expression
1st order	physical object	space	occurrence	NP
2nd order	state of affairs	time	factivity	NP or clause
3rd order	proposition	epistemics	truth	NP or clause
4th order	pragmatic option	deontics	desirability	NP or clause

Table 1

Schematic overview of the four categories and the corresponding conceptual domains.

In any of the four domains it is possible to establish relations which can be encoded by connectives (see Sweetser: 1990, 76ff; Blühdorn: 2008). The relata of such relations will always be entities of the category which constitutes the domain. From spatial over temporal to epistemic and deontic relations, there is a constant increase of conceptual complexity.

3. Types of relations

A similar gradient of complexity can be established for types of relations. Traditional grammar handbooks distinguish between additive, adversative, temporal, conditional, causal, concessive and other relations (see, e.g., Duden: 2005, 1085ff), but those classifications are normally based much more on vague intuitions than on clear-cut criteria. A more systematic account should define types of relations by means of an ordered set of features, so that we are enabled to compare them with each other, to point out which features are shared by relations of two different types, where two relations are in contrast with each other and which one of them is conceptually more complex. Such an account would also have criteria to assess the completeness of an inventory of relation types.

I propose the following set of basic types of relations (see Blühdorn: 2003, 19f; Blühdorn: 2008; Blühdorn: 2010):

- similarity relations,
- situating relations,
- conditional relations,
- causal relations.

Similarity relations are the most simple ones. They have no positive features. They obtain between any two entities that are comprised by a common superordinate category (a common integrator, as Lang: 1984, 69ff calls it). The common integrator may be one of the four basic classes of entities discussed in the last section, or any narrower category. Within this superordinate category, the two entities may be identical to each other, or they may be in any kind of contrast. As long as the relation is symmetrical, i.e., as long as A is in the same relation to B as B is to A, it is a similarity relation. The relata of such a relation have the same relational roles and the same weight within the relation.

Conceptual symmetry of a relation manifests itself linguistically in the reversibility of the sequence of the connected expressions:

- (7a) *Peter **und** Paul*
'Peter **and** Paul'
- (7b) *Paul **und** Peter*
'Paul **and** Peter'

- (8a) *Sie heiratete **und** wurde schwanger.*
'She married **and** got pregnant.'
- (8b) *Sie wurde schwanger **und** heiratete.*
'She got pregnant **and** married.'

- (9a) *die Katze **unter** dem Sofa*
'the cat **under** the sofa'
- (9b) *das Sofa **unter** der Katze*
'the sofa **under** the cat'

We cannot observe any change of descriptive meaning from (7a) to (7b), but we can observe such a change of meaning in natural readings of (8a/b) and, of course, in (9a/b). The examples in (8a/b) show that the commutability or non-commutability of the connected expressions is a matter of semantic interpretation and not a consequence of the syntax of coordinating conjunctions. The relata in (7a/b) are understood as being in a similarity relation, whereas the relations in (8a/b) and (9a/b) are understood as being more complex.

More complex means in the first place 'asymmetric', i.e., the relata have different relational roles and different weight within the relation. The most simple type of asymmetric relations are situating relations. They assign a place to an entity E in the appropriate conceptual domain. The place is described with the help of another entity R which serves as a reference point:

- (10) *Nachdem er das Licht gelöscht hatte* (reference point – R),
verließ Peter den Raum (entity to be situated – E).
'**After** he had switched off the light, Peter left the room.'

R and E are what I call the relational roles of the relata in an asymmetric relation (for more details see Blühdorn: 2008). In (10), leaving the room is the entity E: an event which is situated in time in relation to the event R of switching off the light. Situating relations are static, i.e., the value assigned to any of the relata is independent of the value assigned to the other relatum. If we interpret the relation in (10) as a situating relation, we understand that switching off the light and leaving the room happened in the described temporal sequence, but none of them influenced the factivity of the other. In contrast, if we understand (10) in such a way that Peter's having switched off the light somehow triggered or motivated his leaving the room or that his intention to leave the room influenced his decision to switch off the light, then we interpret the relation as something more complex than a situating relation.

More complex in this case means 'dynamic'. In a dynamic relation, one of the relata influences the value to be assigned to the other relatum. The relata have different thematic roles, one of them being a CONDITION³ or CAUSE, and the other one being a CONSEQUENCE or EFFECT. The conceptually simpler type of dynamic relations are conditional relations. They do not fix the value to be assigned to the relatum which functions as the CONSEQUENCE. Two examples:

- (11) *Hypnose funktioniert* (CONSEQUENCE – E), *wenn man weiß, wie es geht* (CONDITION – R).
'Hypnosis works **if** you know how to do it.'
- (12) *Maria macht jetzt einen Kurs* (CONDITION – E), *damit Sie lernt, wie Hypnose funktioniert* (CONSEQUENCE – R).
'Mary is taking a course now, **so that** she may learn how hypnosis works.'

In a likely interpretation, (11) tells us that it will be possible for hypnosis to work in a context in which the condition is fulfilled that the relevant people know how to do it. It does not tell us whether this condition is in fact fulfilled in any context, and therefore it does not tell us either whether there is any context in which hypnosis works. This is what I call an open effect-value. Similarly, (12) tells us that Mary's taking a course is considered a condition which makes it possible for her to learn how hypnosis works. It does not tell us whether the course will in fact have this consequence. Again, the effect-value is left open. Note that (11) and (12) exemplify inverse patterns of thematic role assignment. In (11) CONDITION is assigned to R and CONSEQUENCE to E; in (12) the assignment is the other way round.

Example (11) could also be uttered in a context in which it is unanimous between speaker and hearer that hypnosis has just happened to work. In this case it would be a means for the speaker to suggest that s/he her/himself in fact knows how to do it. If (11) is interpreted this way, the effect-value is not left open. In this case the relation is understood as something more complex than a conditional relation.

More complex at this point means that the effect-value is fixed. The relata are then linked by a causal relation. Examples (13) and (14) can only be interpreted in this sense. Again, they illustrate inverse patterns of thematic role assignment:

- (13) *Weil der Löwe gerade in den Spiegel schaute* (CAUSE – R), *konnte der Fuchs unbemerkt im Gebüsch verschwinden* (EFFECT – E).
'**As** the lion was just looking into the mirror, the fox managed to disappear silently into the bushes.'
- (14) *Der Löwe schaute gerade in den Spiegel* (CAUSE – E), *sodass der Fuchs unbemerkt im Gebüsch verschwinden konnte* (EFFECT – R).
'The lion was just looking into the mirror, **so that** the fox managed to disappear silently into the bushes.'

Table 2 gives an overview of the four basic types of relations and the distinctive features by which they are defined. CI stands for the common integrator, i.e., a superordinate category which comprises both relata. The possibility to construct a common integrator is a necessary condition for all kinds of semantic relations:

³ I use CAPITALS for names of thematic roles.

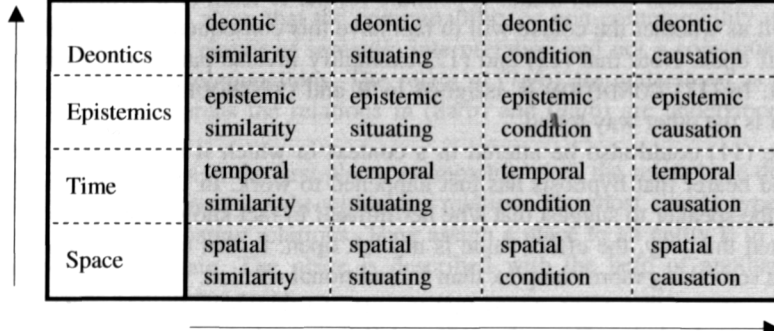
		1st feature	2nd feature	3rd feature
similarity relations	CI			
situating relations	CI	+ asymmetric		
conditional relations	CI	+ asymmetric	+ dynamic	
causal relations	CI	+ asymmetric	+ dynamic	+ fixed effect value

Table 2

Overview of the four basic types of relations and their respective defining features.

4. The universe of semantic relations

Relations of all four types can be established in any of the four conceptual domains. This is shown in Table 3:



	Similarity	Situating	Condition	Causation
Deontics	deontic similarity	deontic situating	deontic condition	deontic causation
Epistemics	epistemic similarity	epistemic situating	epistemic condition	epistemic causation
Time	temporal similarity	temporal situating	temporal condition	temporal causation
Space	spatial similarity	spatial situating	spatial condition	spatial causation

Table 3

The four types of relations in the four conceptual domains.

The table is meant to give a complete account of the universe of semantic relations capable of being encoded in language. This means that any semantic relation established between two linguistic expressions by means of a connective is either a similarity relation, or a situating relation, or a conditional relation, or a causal relation, and its relata are either physical objects, or states of affairs, or propositions, or pragmatic options.

Just for the purpose of illustration, we can insert into this table all the types of semantic relations known from traditional grammars:

	Similarity	Situating	Condition	Causation
Deontics				
Epistemics		(modal) adversative		conclusive evidential
Time		temporal	final instrumental	instrumental concessive
Space	comparative disjunctive additive	local	concessive conditional	consecutive causal

Table 4

Semantic relations known from traditional grammars.

The four domains and the four types of relations form gradients of increasing conceptual complexity (the directions of increase being shown by the arrows in the table). Relations of less complex types frequently serve as starting points for conceptualizations which end up in relations of more complex types. This is mirrored in the broad range of different uses and interpretations available for many connectives. The preposition *nach*, e.g., originally encodes a situating relation of spatial proximity (see Paul: 1992, 593). In present day German, it is used to indicate a spatial goal:

- (15) *Maria warf eine Teekanne **nach** ihrem Mann.*
 'Maria threw a teapot **at/after** her husband.'

The same preposition can also be used to indicate a situating relation in time (posteriority on the timeline):

- (16) ***Nach** dem Mittagessen rauchte Otto eine Pfeife.*
 'After lunch Otto smoked a pipe.'

Moreover, it can be used to indicate epistemic and deontic situating relations (epistemic or deontic posteriority):

- (17) ***Nach** allem, was ich weiß, heißt er in Wirklichkeit Mustafa.*
 'For all I know, his real name is Mustafa.'
- (18) ***Nach** dem Willen seiner Eltern sollte er Rechtsanwalt werden.*
 'In the intention of his parents he should become a lawyer.'

In general, spatial relations can be reinterpreted as temporal relations, temporal relations as epistemic relations, and epistemic relations as deontic relations, just as similarity relations can be reinterpreted as situating relations, situating relations as conditional relations, and conditional relations as causal relations (see examples (7) to (12) above). Reinterpretations in the opposite directions are rare exceptions, if they occur at all.

5. Classes of connectives

It is a general characteristic of verbal communication that linguistic expressions are semantically underspecified (see Posner: 1980, 182ff; Levinson: 2000, 114ff; Blake-more/Carston: 2005). Speakers can only encode an indispensable minimum of information as a guideline for interpretation. Many details that are not explicitly encoded must be added by the interpreter in order to make communication successful.

This principle is also valid for the use and interpretation of connectives. The preposition *nach*, e.g., encodes a relation of posteriority on a vector, interpreted by default as a goal in the domain of space. If this reading does not result in a satisfactory understanding of a given utterance in its context, temporal, epistemic or deontic reinterpretations of the relation are available. Moreover, the situating relation can be reinterpreted as a conditional or even causal one (consequence or effect of a condition or cause), if such a reading increases the relevance of the utterance in the context. Example (16), e.g., can easily lead to the interpretation that having finished lunch does not only describe the moment in time, when Otto smoked his pipe, but was also a relevant condition or even a motive for doing so.

Similarly, the subordinating conjunction *wenn* ('when'), which encodes a situating relation of temporal overlap, is very frequently reinterpreted as indicating a conditional relation, as for example in (11) above, and we have already seen that in certain contexts also a causal reinterpretation may suggest itself. Apart from states of affairs, *wenn* can connect propositions as in (19) and pragmatic options as in (20), i.e., it can also receive epistemic or deontic interpretations:

- (19) *Der Flug ist verspätet, wenn ich richtig informiert bin.*
'The flight is delayed, if I am informed correctly.'

- (20) *Fahren Sie doch mit dem Zug, wenn es Ihnen nichts ausmacht, zu spät zu kommen.*
'Just take the train, if you don't mind being late.'

In a likely interpretation of (19), the speaker's being informed correctly is treated as an epistemic condition for the reliability of the reported proposition. In (20), the addressee's tolerance to delays is presented as a deontic condition for the speaker's recommendation that he takes the train.

Connectives differ as to the range of interpretations they allow. Only very few are specialized on relata of one certain category and relations of one certain type. Possible examples in German are *später* ('later on') and *zwischenzeitlich* ('in the meantime'), which encode situating relations between states of affairs:

	Similarity	Situating	Condition	Causation
Deontics				
Epistemics				
Time		später zwischenzeitlich		
Space				

Table 5

Possible relational readings of *später* and *zwischenzeitlich*.

- (21) *Bei zwei Autos und einem LKW wurden die Fensterscheiben eingeschlagen, als sie durch das Dorf fuhren. **Später** wurde der gesamte Verkehr unterbrochen.*
 ‘Two cars and a truck had their windows broken while passing through the village. **Later on**, all traffic was stopped.’
- (22) *Pfitzer leitete die Schule schon 1980. **Zwischenzeitlich** haben Hunderte von Tanzschulen in ganz Europa sein Konzept übernommen.*
 ‘Pfitzer already conducted the school in 1980. **In the meantime**, hundreds of dance schools all over Europe have borrowed his method.’

(21) and (22) clearly describe temporal relations between states of affairs. I cannot conceive of a context in which *später* or *zwischenzeitlich* could be understood as connecting propositions or pragmatic options, i.e., as indicating an epistemic or deontic relation. Conditional and causal readings of these connectives cannot be totally excluded, but they are certainly not conventionalized.

The majority of German connectives readily allow for reinterpretations, many of which are conventionalized. Most connectives are underspecified with respect to the category of their relata or/and the type of relation. A good example of a connective specialized on relata of one certain category, but underspecified with respect to the type of relation is German *sobald* (‘as soon as’), which basically encodes a situating relation between states of affairs. *Sobald* does not accept relata of other categories, but it accepts situating, conditional and causal interpretations:

	Similarity	Situating	Condition	Causation
Deontics				
Epistemics				
Time		sobald →		
Space				

Table 6
Possible relational readings of *sobald*.

- (23) *Sobald sie das Büro verlassen hatte, fühlte Maria sich schuldig.*
 ‘As soon as she had left the office, Maria felt guilty.’

One possible interpretation of (23) is, that Maria started feeling guilty immediately after the moment in time in which she had left the office. This would correspond to a purely situating relation. A very likely reinterpretation would add the information that having left the office was a relevant condition for or even the cause of Maria’s feeling guilty. This would correspond to a conditional or causal relation, but still between states of affairs. Propositions or pragmatic options cannot be connected with *sobald*.

Good examples of connectives specialized on relations of a certain type, but underspecified with respect to the category of the relata are German *weil* (‘because’) and *trotzdem* (‘nevertheless’). They encode causal relations, but accept states of affairs, propositions and pragmatic options as their relata (see Sweetser: 1990, 76ff on English *because*; Keller: 1995 and Blühdorn: 2006 on German *weil*; Blühdorn/Golubeva: 2007 on concessive relations as a subclass of causal relations and on German *trotzdem*):

	Similarity	Situating	Condition	Causation
Deontics				
Epistemics				
Time				↑ weil trotzdem
Space				

Table 7
Possible relational readings of *weil* and *trotzdem*.

- (24) *Die Marktordnung erlebte damals eine schwere Krise. **Trotzdem** überlebte sie bis zum Ende des Jahrhunderts.*
 ‘At that time the market system underwent a severe crisis. **Nevertheless** it survived until the end of the century.’
- (25) *Die Marktordnung erlebt zur Zeit eine schwere Krise. **Trotzdem** wird sie bis zum Ende des Jahrhunderts überleben.*
 ‘The market system is at present undergoing a severe crisis. **Nevertheless** it will survive until the end of the century.’
- (26) *Die Marktordnung erlebt zur Zeit eine schwere Krise. **Trotzdem** muss sie bis zum Ende des Jahrhunderts überleben.*
 ‘The market system is at present undergoing a severe crisis. **Nevertheless** it must survive until the end of the century.’

In the most likely reading of (24), the relata of *trotzdem* are two states of affairs situated in time before the moment of the utterance. The occurrence of the crisis is presented as an obstacle that interfered with the market system, but did not cut off its survival. In (25), an epistemic reading (a relation between two propositions) seems more natural: The speaker knows that the system is undergoing a crisis but does not consider this sufficient evidence to anticipate an early collapse. The most natural reading of (26) is deontic: The speaker calls for the survival of the market system; the present crisis is a valid but insufficient counter-argument to this claim.

Connectives of a fourth group are underspecified both for the category of relata and the type of relation. A good example is German *da*, which originally encodes a situating relation (‘there’) between physical objects (see Paul: 1992, 156ff). In present day German, *da* also accepts relata of all other categories and allows for situating, conditional and causal readings (‘then’, ‘as’) (for more details see Blühdorn: 2003, 13ff):

	Similarity	Situating	Condition	Causation
Deontics				
Epistemics				
Time				
Space				

Diagram illustrating the possible relational readings of *da*. The table is divided into four quadrants by dashed lines. Arrows indicate the following readings:

- A vertical arrow points from the *da* label in the Space/Time quadrant up to the Deontics/Epistemics quadrant.
- A diagonal arrow points from the *da* label in the Space/Time quadrant up and to the right to the Deontics/Condition quadrant.
- A diagonal arrow points from the *da* label in the Space/Time quadrant up and to the right to the Epistemics/Causation quadrant.

Table 8
Possible relational readings of *da*.

- (27) *Letzten Monat wurde am Ring ein neues Einkaufszentrum eröffnet. Da kann man auch bei schlechtem Wetter einkaufen.*
 'Last month a new shopping mall opened on the city ring-road. **There** you can go shopping even in bad weather.'
- (28) *Letzten Monat wurde am Ring ein neues Einkaufszentrum eröffnet. Da wurde die ganze Stadt mit Fahnen geschmückt.*
 'Last month a new shopping mall opened on the city ring-road. **On that occasion**, the whole town was decorated with flags.'
- (29) *Letzten Monat wurde am Ring ein neues Einkaufszentrum eröffnet. Da werden die örtlichen Einzelhändler bald Umsatzeinbußen erleiden.*
 'Last month a new shopping mall opened on the city ring-road. **So** the local traders will soon suffer a decline in sales.'
- (30) *Letzten Monat wurde am Ring ein neues Einkaufszentrum eröffnet. Da muss ich unbedingt meine Schwester informieren.*
 'Last month a new shopping mall opened on the city ring-road. **So** I must immediately inform my sister.'

In (27), *da* indicates a spatial location: The shops where people can go in bad weather are inside the new mall. In (28), *da* indicates a moment in time: The decoration of the whole town occurred when the new shopping mall was about to be opened. In (29), *da* indicates a location in an epistemic context: In view of the information that the shopping mall has opened, the speaker predicts a decline in sales for the local traders. In (30), *da* indicates a location in a deontic context: Having heard of the new shopping mall, the speaker concludes that it is desirable to immediately inform his/her sister. All these are situating interpretations: A set of physical objects, a state of affairs, a proposition, and a pragmatic option are located in contexts within their respective conceptual domains. In addition, the same examples also allow conditional and some of them even causal interpretations. Thus, the opening of the shopping mall can be understood as the mere moment, as a relevant condition or as the motive for decorating the town with flags, and so forth.

Connectives like *und* ('and') and *oder* ('or') exhibit an even higher degree of underspecification than *da* (see Posner: 1980; Blakemore/Carston: 2005 on English *and*). They basically encode similarity relations between physical objects, but accept relations of all other categories and relational readings of all kinds. For these connectives, we will make do with the table, without discussing more examples:

	Similarity	Situating	Condition	Causation
Deontics				
Epistemics				
Time				
Space	<i>und</i> <i>oder</i>			

Table 9
Possible relational readings of *und* and *oder*.

6. Conclusion

In this paper, I have proposed a model of a structured universe of semantic relations encodable by means of natural language connectives. The model does not follow the traditional approach of establishing *ad hoc* lists of relation types on grounds of uncontrolled intuitions. Instead, it starts out from a minimal ontology comprising four basic categories of entities which define four relational domains of increasing complexity. In a second step, it uses an ordered set of conceptual features for defining four basic types of relations which can be established between relata of any of the four categories.

The model has several theoretical and methodological advantages over traditional lists of relations. In particular, it makes it possible to compare relations of different types, to point out precisely which properties they do and do not have in common, and to assess their conceptual complexity. Evidently it will be necessary to introduce more features in order to define subtypes of relations within each basic class, e.g., the feature { \pm projective} for distinguishing between topological and projective situating relations (see Frawley: 1992, 254ff, 262ff), or the feature { \pm insufficient counter-condition} for singling out concessive relations within the conditional and causal classes (see Blüh-dorn/Golubeva: 2007, 78ff). These additional features could not be discussed here in detail.

The proposed model can be used for giving structured semantic descriptions of individual connectives as well as of whole inventories of connectives. In the last section I have given a provisional sketch of how such descriptions can look like. One thing that should have become clear from this sketch is that meanings of connectives are not arbitrary lists of variants, as traditional dictionaries often present them (see, e.g., the descriptions of *da* and *und* in Duden: 1999, 736 and 4090f.). Rather, the meaning of each connective can be described as a coherent segment of the universe of relations. The leftmost and bottom-most point of the segment will indicate the connective's basic meaning, while the rest of the segment will be the result of reinterpretations and semantic enrichment.

Bibliography

- Alm, M. (2007), *Also darüber lässt sich ja streiten! Die Analyse von also in der Diskussion zu Diskurs- und Modalpartikeln*, Stockholm: Almqvist & Wiksell International.
- Blakemore, D./R. Carston (2005), "The pragmatics of sentential coordination with *and*", *Lingua*, 155, 569–589.
- Blühdorn, H. (2003), "Zur Semantik der Konjunktion *als*. Paradigmatische und syntagmatische Aspekte". *Linguistik online*, 13, 11–53. (Online available under: http://www.linguistik-online.de/13_01/bluehdorn.html).
- Blühdorn, H. (2004a), "Temporalkonnektoren: Einleitung", in: Blühdorn, H./E. Breindl/U. H. Waßner (eds.), *Brücken schlagen. Grundlagen der Konnektorenssemantik*, Berlin: de Gruyter, 125–136.
- Blühdorn, H. (2004b), "Die Konjunktionen *nachdem* und *bevor*", in: Blühdorn, H./E. Breindl/U. H. Waßner (eds.), *Brücken schlagen. Grundlagen der Konnektorenssemantik*, Berlin: de Gruyter, 185–211.
- Blühdorn, H. (2006), "Kausale Satzverknüpfungen im Deutschen": (Online available under: http://www.fflch.usp.br/dlm/alemao/pandaemoniumgermanicum/site/images/pdf/ed2006/Kausale_Satzverknuepfungen_im_Deutschen.pdf).
- Blühdorn, H. (2008), *Syntax und Semantik der Konnektoren. Ein Überblick*. (Online available under: http://www.ids-mannheim.de/gra/texte/blu_ueberblick.pdf).
- Blühdorn, H. (2010), "On the syntax and semantics of sentence connectives". To be published in *Linguistik online* (Draft available under: http://www.ids-mannheim.de/gra/texte/blu_connectives.pdf).
- Blühdorn, H./N. A. Golubeva (2007), "Konzessivkonnektoren und ihre morphologischen Bestandteile im Deutschen und im Russischen", *Das Wort. Germanistisches Jahrbuch Russland*, 23, Moskau, 77–100. (Online available under: http://www.daad.ru/wort/wort2007/7_Bluehdorn%20Golubeva%20Konzessivkonnektoren.pdf).
- Bußmann, H. (ed.), *Lexikon der Sprachwissenschaft*, Stuttgart: Kröner.
- Diewald, G. (2007), "Abtönungspartikel", in: Hoffmann, L. (ed.), *Handbuch der deutschen Wortarten*, Berlin: de Gruyter, 117–141.
- Dik, S. C. (1997), *The Theory of Functional Grammar. Part 1: The Structure of the Clause*, 2nd ed. (ed. Kees Hengeveld), Berlin: Mouton de Gruyter.
- Dimroth, C. (2004), *Fokuspartikeln und Informationsgliederung im Deutschen*, Tübingen: Stauffenburg.
- Duden (1999), *Das große Wörterbuch der deutschen Sprache*, 3rd ed., 10 vols., Mannheim: Dudenverlag.
- Duden (2005), *Die Grammatik*, 7th ed., Mannheim: Dudenverlag.
- Frawley, W. (1992), *Linguistic Semantics*, Hillsdale, NJ: Erlbaum.
- Gethmann, C. F. (1978), "Wahrheit", in: Braun, E./H. Radermacher (eds.), *Wissenschaftstheoretisches Lexikon*, Graz: Styria, 645–648.
- Keller, R. (1995), "The epistemic *weil*". In: Stein, D./S. Wright (eds.), *Subjectivity and subjectivisation. Linguistic perspectives*, Cambridge: Cambridge University Press, 16–30.
- Kortmann, B. (1996), *Adverbial subordination: A typology and history of adverbial subordinators based on European languages*, Berlin: Mouton de Gruyter.
- Lang, E. (1984), *The Semantics of Coordination* (transl. John Pheby), Amsterdam: Benjamins.
- Levinson, S. C. (2000), *Presumptive Meanings. The Theory of Generalized Conversational Implicature*, Cambridge, Mass.: MIT Press.

- Lyons, J. (1977), *Semantics*, 2 vols., Cambridge: Cambridge University Press.
- Pasch, R./U. Brauße/E. Breindl/U. H. Waßner (2003), *Handbuch der deutschen Konnektoren. Linguistische Grundlagen der Beschreibung und syntaktische Merkmale der deutschen Satzverknüpfers (Konjunktionen, Satzadverbien und Partikeln)*, Berlin: de Gruyter.
- Paul, H. (1992), *Deutsches Wörterbuch*, 9th ed. (eds. Helmut Henne and Georg Objartel), Tübingen: Niemeyer.
- Posner, R. (1980), "Semantics and pragmatics of sentence connectives in natural language", in: Searle, J. R./F. Kiefer/M. Bierwisch (eds.), *Speech Act Theory and Pragmatics*, Dordrecht: Reidel, 169–203.
- Schilder, F. (2004), "Temporale Konnektoren im Diskurs", in: Blühdorn, H./E. Breindl/U. H. Waßner (eds.), *Brücken schlagen. Grundlagen der Konnektorenssemantik*, Berlin: de Gruyter, 161–184.
- Sweetser, E. (1990), *From etymology to pragmatics. Metaphorical and cultural aspects of semantic structure*, Cambridge: Cambridge University Press.
- Zifonun, G./L. Hoffmann/B. Strecker et al. (1997), *Grammatik der deutschen Sprache*, 3 vols., Berlin: de Gruyter.